

Marquette Ore Dock No. 6:
Chutes
Fifth to Lake Streets
Marquette
Marquette County
Michigan

HAER No. MI-45-D

HAER

MICH

52-10000,

ID -

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
MID-ATLANTIC REGION, NATIONAL PARK SERVICE
DEPARTMENT OF THE INTERIOR
PHILADELPHIA, PENNSYLVANIA 19106

HISTORIC AMERICAN ENGINEERING RECORD

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MARQUETTE ORE DOCK NO. 6:
CHUTES

HAER No. MI-45-D

Location: On the upper part of the ore dock proper
which is located in the Lower Harbor of
Marquette City, Marquette County, Michigan.

UTM 16.470120.5154000
Quad: Marquette, MI

Date of
Construction: 1931-1932.

Engineer: Merritt-Chapman & Whitney Corporation,
Duluth, Minnesota.

Present Owner: Wisconsin Central, Ltd.
One O'Hare Center
6250 North River Road, Suite 9000
Rosemont, Illinois 60018

Present Use: Vacant.

Significance: The chutes are an important part of the ore
dock through which iron ore passes from the
pockets located in the interior of the
structure to the waiting ore boat.

Project
Information: This documentation was undertaken from June
through August 1990 in accordance with
agreements with Wisconsin Central, Ltd., the
Interstate Commerce Commission, the National
Park Service, and the Michigan State Bureau
of History.

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The chutes and associated steel parts of the dock were the last major parts of the structure to be attached. McClintick-Marshall Corporation of Chicago furnished the steel for the chutes. As the concrete superstructure took shape between 23 July and 11 November 1931, work was started on the metal parts of the dock. On 27 July channels were rivetted to the door frames and beginning on 4 August reinforced steel was placed on the superstructure. This work continued until 11 November. Between 22 August and 7 November the concrete pockets were poured.

As work on the concrete dock progressed the steel doors and chutes were needed. On 7 July a shipment of 500 tons of steel consisting largely of pocket doors arrived from Duluth. In total, approximately 3,000 tons of steel would be used on the dock and additional shipments would arrive as the concrete work called for it.

There would be 75 pockets to a side of the dock for a total of 150 pockets. Construction of the pockets was underway by the middle of August. Outside forms together with the steel doors were put in place on six pockets on 12 August. Inside forms for an additional 20 pockets had been placed. This part of the job was time consuming and the work did not progress as rapidly as anticipated. The reason for this slowdown was the fact that the forms had to be built up separately before being put into place. They were heavy clumsy wooden affairs that required much maneuvering with derricks before they were in the correct position. Absolute accuracy in this work was essential so that the concrete portions of the pockets and the upper dock structure would fit accurately on the steel work. There was no room for error because the steel work was being constructed in other parts of the country, shipped to Marquette partially assembled, with the remainder of the assembly work being done on the site. By 9 September, ten sets of pockets had been completed and the concrete forms were removed and placed in position for additional pockets. Some 25% of the pockets had been completed by the middle of September. As the end of summer approached there was concern for the arrival of steel parts. The fourth shipment of rods and small beams had arrived from Duluth and two more loads were anticipated by the end of the season.

Work continued on the concrete pockets and was ahead of schedule by October 19 and this continued into early November. The last of the pockets were completed by mid-November prior to the start of the winter season. From that point on work was concentrated on the structural steel work on the dock. The chutes were painted and installed and then work on the dock proper was started. The deck steel was set into place between 9 October 1931 and 20 January 1932. During the same period of time the outer end trestle was finished. The 150 hoists were completed by 16

November and they were installed between 18 December 1931 and 10 May 1932. By 11 December, 90% of the structural steel was in place and about 35% of the 150 chutes were installed. Jernsted Electrical Company completed their work between 2 October 1931 and 29 April 1932.

The heart of the Ore Dock consists of 75 pockets on both sides of the structure. Each of the 150 pockets had a storage capacity of seven 50 ton cars of ore. The ore was dropped directly into the pockets and the train left the dock. From a mean low water elevation of 601.60 feet, the elevation of the dock is 85 feet 7 inches. Further it is 43 feet 3 inches from water level to the hinge pin of the chutes. Each of the pockets has a floor angle of 47 1/2 degrees, one side of which is flush with the east wall, leaving a fillet corner only on the west wall. Each chute weighs 4 1/2 tons and measures 36 feet in length and ranges in width from 7 feet 2 1/2 inches at the hinge or butt end down to 4 feet 10 inches inside at the spout end. Electrically powered hoists raise and lower the each of the chutes individually. A 3/8 inch by 5 1/2 inch steel cable connects the hoist to the chute. Each set of eleven hoists is operated by one motor. The only difference occurs in the outer section of the dock where one motor operates a set of nine hoists. The motors are 25 HP, 3 phase, 440 volt, 60 cycle type.

The width of the top of the dock measures 59 feet from side to side. The overhanging deck which supports the hoists and motors measures 67 feet 9 1/2 inches between the handrails.

Set at an angle of approximately 20 degrees to the face of the pockets, the steel pocket doors are controlled by double sliding arms and are raised and lowered by the chute hoists. Both the chutes and doors can be raised or lowered while ore is running from the pockets.

The door frames are imbedded in the concrete and are provided with an extension projecting approximately four feet beyond the front wall face of the concrete. This is built up of a bottom steel apron on the same slope as pocket floors and with side cheek plates to which the chutes are attached. Nothing extends beyond the fender line. The clearance point, or the vertical projection of the fender line to the inner section of the bottom of the chute when raised in an upright position, is at a height of 45 feet 6 inches above the mean low water level of 601.60 feet.

Extending along the exterior face of the pockets on both sides of the dock is a plank walk which is placed above the apron between the pocket doors and the hinge ends of the chutes. This walk provides access to the pocket openings. Four stairways

anchored to the concrete face of the dock provide access to the walk. The stairways terminate at a landing approximately 12 feet above the walk, which is reached by a steel ladder from this point. Steel railings provided adequate protection for workers using the stairs, landings, and walks.

The electric hoist motors went through gradual maintenance and repair at the rate of two motors per year between 1956 and the early 1960s. In the later 1960s costly steel work on the chute liners and ore pocket doors and linings was also completed.

Use of the Ore Dock ended in 1971. A complete inspection conducted in July 1972 found the dock and its approach to be in fairly good condition. There was some wear on the concrete in the pockets which would require future maintenance. The major work required on the dock would be the straightening of chute angles, the installation of splash shields at the chutes, and some welding on the chutes. A later inspection showed that all of the electric motors which were last operated in the spring of 1973 appeared to be in good condition.

A cost repair estimate was made by the Soo Line in 1974. The repairs to the dock and its approaches would be \$38,000 and \$6,000 would have to be spent on the installation of splash shields on the pockets. At the time there was talk that 1.5 million tons would be shipped through the Ore Dock. Unfortunately nothing developed beyond the discussions and cost estimates.

In 1981 there was some renewed interest in rehabilitating the dock and its approaches. A complete inspection of the dock showed that it would have to be rehabilitated if it were to be reopened. The report showed that the shakers and doors were beyond repair and would have to be replaced and 93 front covers and 81 rear covers on the chutes were missing. The hoists would have to be repaired along with the stairs. The Soo Line estimated that the dock electrical equipment and the motors would cost \$19,000.

Due to the lack of use the approach, the wooden deck and stairs of the dock deteriorated. This is best evidenced in a 1981 inspection produced by the railroad. The Soo Line maintained fences and warning signs but both youths and adults, fascinated by the structure, trespassed. Then in the autumn of 1988 two local teenagers walking on the structure discovered a skeleton. A transient, 17 year old, Timothy P. Alain had climbed to the top of the dock some time in the past and had fallen to his death in a chute. In 1990 the chutes and other metal attachments to the dock remain in place but are slowly falling victim to time and the elements.

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